

WHAT IS CLAIMED IS:

1. An article comprising:

a) an oxygen scavenger; and

b) an oxygen indicator comprising a luminescent compound;

wherein the oxygen scavenger and the oxygen indicator are substantially shielded from sources of oxygen exterior to the article.

2. The article of claim 1 wherein the oxygen scavenger comprises a material

selected from the group consisting of:

i) oxidizable organic compound and a transition metal catalyst,

ii) ethylenically unsaturated hydrocarbon and a transition metal catalyst,

iii) a reduced form of a quinone, a photoreducible dye, or a carbonyl compound which has absorbance in the UV spectrum,

iv) a polymer having a polymeric backbone, cyclic olefinic pendent group, and linking group linking the olefinic pendent group to the polymeric backbone,

v) a copolymer of ethylene and a strained, cyclic alkylene,

vi) ethylene/vinyl aralkyl copolymer,

vii) ascorbate,

viii) isoascorbate,

ix) sulfite,

x) ascorbate and a transition metal catalyst, the catalyst comprising a simple metal or salt, or a compound, complex or chelate of the transition metal,

xi) a transition metal complex or chelate of a polycarboxylic acid, salicylic acid, or polyamine,

xii) a tannin, and

xiii) reduced metal.

3. The article of claim 1 wherein the luminescent compound comprises at least one material selected from the group consisting of metallo derivatives of octaethylporphyrin, tetraphenylporphyrin, tetrabenzoporphyrin, or the chlorins, bacteriochlorins, or isobacteriochlorins thereof.

4. The article of claim 1 wherein the article is in the form of a film.

5. The article of claim 1 wherein the article comprises:

a) a film comprising:

i) a first layer comprising an oxygen barrier having an oxygen transmission rate of no more than 100 cc/m²/24hr at 25°C, 0% RH, 1 atm (ASTM D 3985);

ii) a second layer comprising a blend of the oxygen indicator comprising a luminescent compound, and the oxygen scavenger; and

b) a patch comprising an oxygen barrier having an oxygen transmission rate of no more than 100 cc/m²/24hr at 25°C, 0% RH, 1 atm (ASTM D 3985), the patch adhered to the film.

6. The article of claim 1 wherein the article is in the form of a film comprising:

i) a first layer comprising an oxygen barrier having an oxygen transmission rate of no more than 100 cc/m²/24hr at 25°C, 0% RH, 1 atm (ASTM D 3985);

ii) a second layer comprising the oxygen indicator comprising a luminescent compound; and

iii) a third layer comprising the oxygen scavenger.

7. The article of claim 6 wherein the film comprises a fourth layer comprising a sealant.

8. The article of claim 6 wherein the oxygen indicator comprises a printed image.

9. The article of claim 1 wherein the article comprises:

a) a film comprising:

i) a first layer comprising an oxygen barrier having an oxygen transmission rate of no more than 100 cc/m²/24hr at 25°C, 0% RH, 1 atm (ASTM D 3985);

ii) a second layer comprising the oxygen scavenger; and

- iii) a third layer comprising the oxygen indicator comprising a luminescent compound; and
- b) a patch comprising an oxygen barrier having an oxygen transmission rate of no more than 100 cc/m²/24hr at 25°C, 0% RH, 1 atm (ASTM D 3985), the patch adhered to the film.

10. The article of claim 9 wherein the film comprises a fourth layer comprising a sealant.

11. The article of claim 1 wherein the article comprises:

- a) a film comprising the oxygen scavenger; and
- b) a patch comprising
 - i) an oxygen barrier having an oxygen transmission rate of no more than 100 cc/m²/24hr at 25°C, 0% RH, 1 atm (ASTM D 3985), and
 - ii) the oxygen indicator comprising a luminescent compound.

12. The article of claim 11 wherein the film comprises

- i) a first layer comprising an oxygen barrier having an oxygen transmission rate of no more than 100 cc/m²/24hr at 25°C, 0% RH, 1 atm (ASTM D 3985); and
- ii) a second layer comprising the oxygen scavenger.

13. The article of claim 11 wherein the patch comprises

- i) a first layer comprising the oxygen barrier having an oxygen transmission rate of no more than 100 cc/m²/24hr at 25°C, 0% RH, 1 atm (ASTM D 3985);
- ii) a second layer comprising an adhesive; and
- iii) a third layer comprising the oxygen indicator comprising a luminescent compound;

wherein the oxygen indicator is encapsulated by the adhesive.

14. The article of claim 1 wherein the article comprises:

- a) a bottle wall comprising:
 - i) a first layer comprising a polymer comprising polyethylene terephthalate;
 - ii) a second layer comprising the oxygen scavenger; and
 - iii) a third layer comprising a polymer comprising polyethylene terephthalate; and
- b) a patch comprising
 - i) an oxygen barrier having an oxygen transmission rate of no more than 100 cc/m²/24hr at 25°C, 0% RH, 1 atm (ASTM D 3985), and
 - ii) an oxygen indicator comprising a luminescent compound.

15. A package comprising:

- a) a tray comprising a barrier liner, and a tray flange;
- b) an oxygen sensitive product disposed on the tray; and
- c) a film, disposed over the oxygen sensitive product and adhered to the tray flange, comprising:
 - i) a first layer comprising an oxygen barrier having an oxygen transmission rate of no more than 100 cc/m²/24hr at 25°C, 0% RH, 1 atm (ASTM D 3985);
 - ii) a second layer comprising an oxygen scavenger; and
 - iii) a third layer comprising an oxygen indicator comprising a luminescent compound.

16. The package of claim 15 wherein the oxygen barrier comprises a material selected from the group consisting of polyester, polyamide, ethylene vinyl alcohol copolymer, polyvinyl alcohol homopolymer, polyvinyl chloride, homopolymer and copolymer of polyvinylidene chloride, polyethylene naphthalate, polyacrylonitrile homopolymer and copolymer, liquid crystal polymer, SiO_x, carbon, metal, and metal oxide.

17. The package of claim 15 wherein the oxygen scavenger comprises a material selected from the group consisting of:

- i) oxidizable organic compound and a transition metal catalyst,

- ii) ethylenically unsaturated hydrocarbon and a transition metal catalyst,
- iii) a reduced form of a quinone, a photoreducible dye, or a carbonyl compound which has absorbance in the UV spectrum,
- iv) a polymer having a polymeric backbone, cyclic olefinic pendent group, and linking group linking the olefinic pendent group to the polymeric backbone,
- v) a copolymer of ethylene and a strained, cyclic alkylene, and
- vi) ethylene/vinyl aralkyl copolymer,
- vii) ascorbate,
- viii) isoascorbate,
- ix) sulfite,
- x) ascorbate and a transition metal catalyst, the catalyst comprising a simple metal or salt, or a compound, complex or chelate of the transition metal,
- xi) a transition metal complex or chelate of a polycarboxylic acid, salicylic acid, or polyamine,
- xii) a tannin, and
- xiii) reduced metal.

18. The package of claim 15 wherein the luminescent compound comprises at least one material selected from the group consisting of metallo derivatives of octaethylporphyrin, tetraphenylporphyrin, tetrabenzoporphyrin, or the chlorins, bacteriochlorins, or isobacteriochlorins thereof.

19. The package of claim 15 wherein the third layer comprising the oxygen indicator comprising a luminescent compound is disposed in the film in the form of a stripe or spot.

20. The package of claim 15 wherein the third layer comprising the oxygen indicator comprising a luminescent compound comprises a printed image.

21. An article comprising:

- a) a first layer comprising an adhesive;
- b) an oxygen indicator comprising a luminescent compound, the oxygen indicator encapsulated by the adhesive; and

- c) a second layer comprising an oxygen barrier having an oxygen transmission rate of no more than 100 cc/m²/24hr at 25°C, 0% RH, 1 atm (ASTM D 3985).

5 22. The package of claim 21 wherein the luminescent compound comprises at least one material selected from the group consisting of metallo derivatives of octaethylporphyrin, tetraphenylporphyrin, tetrabenzoporphyrin, or the chlorins, bacteriochlorins, or isobacteriochlorins thereof.

10 23. The article of claim 21 wherein the oxygen barrier comprises a material selected from the group consisting of polyester, polyamide, ethylene vinyl alcohol copolymer, polyvinyl alcohol homopolymer, polyvinyl chloride, homopolymer and copolymer of polyvinylidene chloride, polyethylene naphthalate, polyacrylonitrile homopolymer and copolymer, liquid crystal polymer, SiO_x, carbon, metal, and metal oxide.

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